

This is now allocated as follows :—

	Acres
Natural History Museum and grounds, including private roadway between E. and W. boundaries, up to the original fence	11.64
Imperial College, Post Office, and Meteorological Office, and necessary open spaces	3.3
	<hr/> 14.94

Say 15 acres.

These 15 acres deducted from the 21 acres leaves 6 acres for the purposes of the Science Museum, roughly only 2 acres more than the area actually occupied by the Natural History Museum building.

Now to use even a part of this area for a Science Museum, which must eventually stretch right across the strip, the Spirit Museum, not necessarily the building, but its inflammable contents, must go. If there is any opprobrium attached to this suggestion, I am content that it should fall on my shoulders, for I was careful to point out this necessity in my Memorandum of 1907 written for the information of the Royal Commission, and I do not know that anyone had considered the question before that year. If there is any difficulty about placing the enlarged Spirit Museum along Queen's Gate, it can be built in two portions east and west of the entrance in Cromwell Road. The future extensions of the Museum might then be erected on the frontages to Queen's Gate and Exhibition Road.

It will be noticed that my figures give a little larger area for the Science Museum than those shown in the "Further Correspondence" (Cd. 5673); this arises from the fact that I not only take the original line of fence, but consider the already existing road to the north of the Natural History Museum is sufficient to serve the purposes of both Museums. If the two organisations work together, not only would space be thus saved, but the amenities of the gardens, until they are built over, would be made common to both Museums.

I now come to the real question at issue in which the Nation is chiefly interested. Now that we have an Imperial College responsible for the highest teaching, both in the Physical and Biological Sciences, represented by the two Museums, it is clear that the highest efficiency of the teaching, if Museums are worth anything, will be secured by all three institutions being as close together as possible.

There would then be a grave objection to one of the courses recommended by one of your biological correspondents, namely, that the whole of the remaining 6 acres should be added to the Natural History domain, making in all nearly 17 acres, of which at present they use about 4, while the Museum dealing with all the other branches of Science should go elsewhere.

It must not be forgotten, too, that the munificent offer of the Royal Commission of 100,000l., now made for the third time, towards the building of the Science Museum has been made on the understanding that the Museum was to be built on land conveyed to the Government by them in accordance with the Prince Consort's views that the National Collections of all kinds should be housed on it.

The Science Museum must then take its place by the side of the Natural History Museum on the South Kensington site. What is it to include? What is likely to be its rate of expansion? It should include all the products of men's ingenuity in science, both pure and applied: it should form the base of the discoveries and the applications of the future in all scientific directions. It should be to the worker in science what the British Museum Library is to the student in literature—a stepping-stone to higher things.

As we have in it to deal with the works of man, and over an enormous field, the new Science Museum should from the start increase rapidly year by year, while the Natural History Museum, dealing with the works of nature, is already an old institution, and has largely completed its general collections. Nature's new species, representing animal advance, are not produced at the rate at which, at this moment, man's new species, representing intellectual and material advance, come into being.

An acre, therefore, for the Science Museum about the

same as that thought necessary for the Natural History Museum by Lord Palmerston when the land was purchased, an area, indeed, not yet occupied by the buildings for that Museum, should not be considered excessive for the Science Museum. Moreover, it is certain, when space is available, to increase more rapidly than the Natural History Museum, and it will be pinched for space before two generations are out unless the design for the Museum building is prepared on a scheme that will take full advantage of modern methods of construction with the possibility of several superimposed stories of Exhibition Galleries readily accessible by lifts. The frontage Galleries of the adjoining Art Museum show how much can be done in this way.

This being so, is it just and decorous for representatives of the biological societies to claim more space when they already have more than they will require during the next century, judging by the rate of expansion during the last thirty years?

At the same time, it is not to be denied that recent investigations have opened out new inquiries of a most important and far-reaching character. And what has happened in the past may occur again in the future. Ample space must be forthcoming to provide for all such contingencies.

This does not necessarily suppose great expansion of exhibition space; but it may do so, and it will assuredly require the provision of adequate accommodation for investigation of the collections now existing or to be formed.

With regard to extensions of the two Museums in the distant future there is no difficulty. There is a block of houses and mews covering roughly 6 acres to the west of Queen's Gate, and opposite the 21 acres of Government ground. The ultimate purchase of this would allow of the two frontages being continued. It is fair to leave to a future generation the question of such an extension, for we cannot forecast the nature of the demands which may then be made for further Museum accommodation.

Has not the moment at last come when all those interested in science in its various aspects should co-operate to find the solution of a question which has been debated for a generation? There should be no contention between these persons—their aims are the same; they desire to afford the best facilities for the increase and coordination of knowledge in all its branches. In my opinion it can be shown that all this can be accomplished at South Kensington, and a really splendid monument can be provided. Is this the moment for contention as to whether this or that branch has a big enough show? Ought we not rather to come together and see how best to utilise what we have got?

(Signed) NORMAN LOCKYER.

NOTES

THE Faraday lecture of the Chemical Society will be delivered by Prof. T. W. Richards, of Harvard University, on Wednesday, June 14, in the theatre of the Royal Institution.

THERE will be a display of calculating machines on Tuesday, June 13, at the Royal Statistical Society's house, 9 Adelphi Terrace, W.C., from 4 to 5.30, during an at home, for which invitations have been issued.

THE second Biennial Congress of the Far Eastern Association of Tropical Medicine is to be held in Hong Kong from January 20 to 27, 1912. The association is international, and, as the title denotes, was formed to promote the study of tropical medicine in the Far East.

THE death is announced of Prof. Samuel Calvin, professor of geology in the State University of Iowa, and State geologist of Iowa. Prof. Calvin was seventy-one years of age, and had been connected with the University of Iowa for thirty-seven years.

At the annual general meeting of the Institution of Electrical Engineers, held on Friday last, Mr. S. Z. de Ferranti was elected president, and Mr. W. Duddell, F.R.S., Major W. A. J. O'Meara, C.M.G., Mr. W. H. Patchell, and Mr. J. F. C. Snell vice-presidents, for the session 1911-12.

A FESTIVAL in memory of Richard Jefferies is to be held at Swindon on Saturday, June 10. Jefferies was born at Coate, near Swindon, and spent his early life in the latter place. It is proposed to pay a visit to Coate Farm, the naturalist's birthplace, and an open-air concert, morris dancing, speeches, and a short service in Chiseldon Church have been arranged for.

THE sum of 1000*l.* has been placed at the disposal of the Home Secretary by a colliery proprietor to form a prize for the best and safest electric lamp for use in mines, and Messrs. C. Rhodes and C. H. Merz have consented to act as judges upon the lamps submitted. The competing lamps must be addressed: care of Mr. C. Rhodes at the Home Office Testing Station, Rotherham, and must be delivered by, at latest, December 31 next.

AN appeal is being made to all who are interested in photography, or in the history, archæology, and science of Kent, to become members and correspondents of the Photographic Record and Survey of the county, and to contribute, if possible, half-a-dozen prints each year to the collection in the County Museum of Maidstone. At the recent annual general meeting Sir David Salmons, Bart., was re-elected president, and the secretary reported that 553 prints had been added to the survey collection during the year. Prospectuses of the survey and any information relating to it will be gladly supplied by the secretary, Mr. H. E. Turner, 14 Queen's Road, Tunbridge Wells.

At the anniversary meeting of the Linnean Society, held on May 24, the following officers and council were elected for the ensuing year:—*President*, Dr. D. H. Scott, F.R.S.; *treasurer*, Mr. H. W. Monckton; *secretaries*, Dr. B. Daydon Jackson, Prof. A. Dendy, F.R.S., and Dr. Otto Stapf, F.R.S.; *council*, Prof. V. H. Blackman, Mr. H. Bury, Sir Frank Crisp, Prof. A. Dendy, F.R.S., Prof. J. Stanley Gardiner, F.R.S., Mr. E. S. Goodrich, F.R.S., Mr. H. Groves, Prof. W. A. Herdman, F.R.S., Mr. A. W. Hill, Dr. B. Daydon Jackson, Mr. H. W. Monckton, Prof. F. W. Oliver, F.R.S., Prof. E. B. Poulton, F.R.S., Dr. A. B. Rendle, F.R.S., Dr. W. G. Ridewood, Miss Edith R. Saunders, Dr. D. H. Scott, F.R.S., Dr. Otto Stapf, F.R.S., Miss E. N. Thomas, and Dr. A. Smith Woodward, F.R.S.

At the anniversary meeting of the Royal Geographical Society, the Founder's medal was awarded to Colonel P. K. Kozloff for his explorations in Central Asia since 1883, and the Patron's medal to Dr. J. B. Charcot for his expeditions to the Antarctic continent. The Victoria research medal was awarded to Captain H. G. Lyons, F.R.S., for his work on the Nile Basin and the topographical, cadastral, and geological surveys in Egypt, which he directed when Director-General. Other awards were made to Dr. Wilfred Grenfell, of Labrador, Captain G. E. Leachman for work in Arabia, Dr. Arthur Neve for his investigations in the Himalayas, and to Mr. R. L. Reid for his surveys of the Aruwiari River.

THE anniversary dinner of the Royal Geographical Society was held on May 26 at the Hotel Cecil, when Lord Curzon, the president of the society, reviewed the many striking events of geographical importance which had

occurred during his predecessor's tenure of office. He alluded to the very inadequate accommodation which the society possessed at the present time, and urged that, in the interest of the scientific development of the subject in this country, better and more commodious premises were urgently needed. Twenty-two past and present medallists of the society were present, and Sir John Forrest, who was honoured by the society as early as 1870, and Dr. Charcot, one of the medallists of this year, responded on their behalf.

THE *Terra Nova*, the vessel which conveyed Captain Scott and his expedition to their base of operations, has now been overhauled and chartered by the New Zealand Government for surveying work. Sailing from Christchurch in July, work will be carried out on the northern coast of North Island, and then between the northern coast and the small islands of Manawa Tawhi. The delimitation of the 100-fathom lines and shoal soundings are to be undertaken which should lead to results of much practical importance. The Central News further reports that Mr. D. G. Lillie, a biologist of the Antarctic expedition, has, in sorting and preserving specimens for transmission to Europe for study by specialists, recognised that the collection contains a number of species of invertebrates hitherto unknown.

PROF. W. L. GRANT, professor of colonial history at Queen's University, Kingston, Canada, lectured before the Royal Geographical Society on Monday last on the geographical conditions affecting Canada. After alluding to the physical character of the country, the lecturer pointed out the immense resources, agricultural, mineral, and climatic, which must inevitably give Canada before many decades a dominant position in the Empire. Much remains to be done, but the large ideas of early pioneers have been fully justified, and bold schemes for the further development of the country are being confidently put forward. Still, there is great need of an adequate inventory of the Dominion's resources, which, though vast and imperfectly known, are of the greatest value, and any squandering of them needs carefully to be guarded against.

THE Research Committee of the National Geographic Society of Washington, it is reported in *Science*, has made a grant of 1000*l.* for continuing the glacier studies of the two previous years in Alaska. The work, beginning in June next, will be done by Prof. R. S. Tarr, of Cornell University, and Prof. Lawrence Martin, of the University of Wisconsin, who have directed the National Geographic Society's Alaskan expeditions of 1909 and 1910 in the Yakutat Bay, Prince William Sound, and lower Copper River regions. This year's expedition will study briefly a number of regions of glaciers not previously investigated by the National Geographic Society, although partially mapped by the Alaska Division of the U.S. Geological Survey. Work will be done on the present ice tongues and the results of glaciation in the mountains and plateaus of parts of the interior and some of the fiords of south-eastern Alaska, the former having lighter rainfall and smaller ice tongues than the Yakutat Bay and Prince William Sound regions.

In a paper read at the Buxton meeting of the Association of Water Engineers on May 20, on the water supplies of the river basins of England and Wales, Mr. W. R. Baldwin-Wiseman, of Southampton, directed attention to the lack of proper coordination and control in the administration of the fresh-water resources of this country. He pointed out the pressing need for river boards, which,

while thoroughly representative of local interests, would subordinate their functions to the general direction of a national hydrographical department, and he considered that this body should be represented in Parliament by a Minister of Water Supply. It is certainly true that, compared with the highly efficient hydrological organisations existing in France, Italy, and the United States, the efforts of similar bodies in Great Britain are local and sporadic, and this lack of interdependence and control is conducive neither to a satisfactory conservation of our resources nor to their effective development. Mr. Baldwin-Wiseman has also dealt with the matter in a paper on the administrative aspect of water conservancy, read before the Society of Engineers in April last. Both papers are timely, for the problem is one which must inevitably be faced and solved at no distant date.

At the last scientific meeting of the Zoological Society Dr. C. W. Andrews, F.R.S., gave an account of some fossil mammalian remains lately received at the British Museum (Natural History) from British Central Africa. The specimens, which were collected on the eastern side of Lake Victoria Nyanza, were sent to the museum by Mr. C. W. Hobley, C.M.G., Commissioner of Mines for the district. For the most part only fragments of bones are preserved, but in addition to these there is a portion of a mandible of a small species of *Dinotherium* with several well-preserved teeth, so that there is no doubt as to the genus. The species seems to be very closely similar to *Dinotherium cuvieri* from the Lower and Middle Miocene of France, and it may be that the beds from which the African species is derived are of the same age; but, on the other hand, it is also possible that *Dinotherium* survived in Central Africa long after it became extinct elsewhere, in which case the deposits may be of a later date. The interest of this discovery is that it is the first record of the existence of Tertiary mammals in Central Africa, and that when the age and relationship of the beds in which they occur are known, much light may be thrown on the geological history of the African lakes. In the same beds occur fragments of a small rhinoceros, a giant land-tortoise, *Trionyx*, and crocodile. The excellent condition in which the bones are preserved gives great hope that careful collections will lead to the discovery of new forms which will clear up many obscure points on the history of the Mammalia.

THE summer meeting of the Concrete Institute will be held in the Lecture Hall, Denison House, Vauxhall Bridge Road, on June 7 and 8, when the following papers will be read and discussed:—The æsthetic treatment of concrete, by Prof. Beresford Pite, after which an interim report of the Tests Standing Committee on the testing of concrete, reinforced concrete, and materials employed therein will be presented, and the Y.M.C.A. building, Manchester, by Mr. A. E. Corbett, to be followed by the presentation of a report of the Reinforced Concrete Practice Standing Committee on the standardisation of drawings of reinforced concrete work. The first annual dinner of the institute will take place in the evening of June 7, and in the evening of the following day there will be a conversation in the galleries of the Royal Institute of British Architects.

THE programme of the jubilee meeting of the Institution of Naval Architects (which, as already announced, is to take place on July 5, 6, and 7) has just been issued. We learn from *Engineering* that among the papers to be presented are the following:—Warship building, by Sir P. Watts; naval engineering, by Engineer-Vice-Admiral Sir

H. Oram; naval artillery, by Sir A. Noble; mercantile shipbuilding, by Dr. S. J. P. Thearle; steam turbines, by the Hon. C. A. Parsons; armour, by Mr. C. E. Ellis; fifty years' architectural expression of tactical ideas, by Admiral Sir C. Bridge; the history of the institution and the progress of scientific education in naval architecture, by Sir W. White; some further notes on cavitation, by Mr. S. Barnaby; naval construction, by Rear-Admiral Kondo; naval engineering, by Engineer-Rear-Admiral Fujii; mercantile shipbuilding, by Mr. Yukawa and Dr. Terano; and a paper on the service performance of two Japanese turbine-driven ships. A paper on passenger steamboat construction will be read by Mr. F. E. Kirby, and one on the results of tests on models of submarines by Mr. M. F. Chace. Prof. Rateau will deal with the rational application of the turbine to ship propulsion, and Prof. Marbec with the collapsing of beams and elastic curve slips. Dr. O. Schlick will treat of the present knowledge of the vibration phenomena of steamers, and Prof. O. Flamm will deal with the scientific study of naval architecture in Germany. Lieut.-Colonel G. Russo will review progress in shipbuilding in Italy, and Mr. J. Johnson that of recent developments in the transportation of ore.

MR. R. D. BANERJEA, of the Indian Archaeological Department, announces the discovery at Dacca, on a temple image of the terrible goddess Chandi, consort of Siva, an inscription of the reign of Lakshmana Sena Deva, King of Bengal, dated 1122 A.D. This is the first inscription of the kind from eastern Bengal proper which gives the date of a king of Bengal. He is said to have reigned over a tract of country extending from Benares to the Garo Hills, and from the Himalayas to the sea. The result of this discovery is that, in the light of the fresh information which it supplies, the greater portion of the ancient history of the Province of Bengal must be rewritten.

It has repeatedly been stated that the effects of a tropical sun in inducing sunstroke, &c., are due more to the chemical than to the heat rays, and therefore clothing lined with or made of a fabric of material which does not transmit the chemical rays has been recommended for wear in tropical climates. An experiment with orange-red underwear has been tried in the Philippines, and is recorded by Captain Phalen, of the U.S. Army. No beneficial effect whatever was observed from the use of this clothing; on the contrary, it added to the burden of heat upon the system, and it is concluded that white or khaki clothing sufficiently excludes the chemical rays (*Philippine Journal of Science*, v., No. 6, 1910, p. 525).

IN the report of the Zoological Society of Philadelphia for the past year stress is laid on two factors in regard to the well-being of animals in captivity, namely, the importance of *post mortem* parasitical investigations and the success of the outdoor treatment. Even the loss of the tips of their tails through frost-bite by a pair of hamadryad baboons is considered no bar to the continuance of the "simple life" method.

MR. C. FORSTER-COOPER, who recently made an expedition to the Bugti Hills of Baluchistan for the purpose of collecting fossil mammals, has returned to this country. A considerable series of fossils are, we understand, on their way home, and will eventually be added to the collections of the British Museum. The first mammalian fossils from the Bugti Hills were collected by the late Dr. Blanford and described by Mr. Lydekker; they indicate a lower

horizon than the typical Siwalik fauna. A number of new types have recently been described by Mr. Guy Pilgrim.

FROM a report contributed by Dr. F. A. Jentink to Nos. 2 and 3 of vol. xxxiii. of Notes from the Leyden Museum, it appears that the recent Dutch expedition to the Snow Mountains of New Guinea did not obtain anything very striking in the way of mammals. In fact, the only novelties are three species of pouched mice of the genus *Phasgologale*, one of which is the largest, and a second the smallest, of the Papuan representatives of the group. A lower jaw of a peculiar rat, *Anisomys indicator*, hitherto known only by a couple of specimens and characterised by the extreme narrowness of the lower incisors, was, however, obtained from the natives.

WE have been favoured with a copy of a pamphlet, by Prof. Berthold Hatschek, of Vienna (published by W. Engelmann, of Leipzig), entitled "Das Neue Zoologische System." In this scheme, which is the last of several already prepared by the same author, the animal kingdom is divided into the two sections Protozoa and Metazoa, and the latter again subdivided into three main groups, namely, Coelenterata (including sponges), Ecterozoëlia, and Enterocoëlia, the last comprising Chaetognatha, Echinodermata, Brachiopoda, Enteropneusta, Tunicata, and Vertebrata, while the second group embraces all other metazoan invertebrates except coelenterates. The Coelenterata are regarded as the direct descendants of the Protozoa; but the chief novelty claimed for the scheme is the independent derivation of the two main groups of Coelosomata, that is to say, the Ecterozoëlia and Enterocoëlia, from distinct groups of Coelenterata.

THE May number of *The Zoologist* contains an account of a new earthworm or treeworm recently discovered by the Rev Hilderic Friend. It is named *Dendrobaena mercensis*, Friend, because it was found near the old capital of Mercia. At first sight it resembles *D. beddardi* and *Bimastus eiseni*, but it differs from these in the fact that the girdle extends from the twenty-second to the thirty-first segment. It is destitute of tubercula pubertatis. In the same journal we have a continuation of the same author's studies in the distribution of British annelids, in which the county records are set forth alphabetically. There are no records known to the author for Bedford, Berkshire, or Cheshire, but we find Bucks credited with eleven species of earthworm, Cambridge sixteen, the Channel Islands and Cornwall twelve, Cumberland seventeen, and Derbyshire sixteen. The total number of known British species has now been raised by Mr. Friend to forty.

IN Heft 4 of the *Zeitschrift der Gesellschaft für Erdkunde* Dr. A. Grund describes the hydrographical results of the first cruise of the steamship *Najade*, which has been detailed by the Austrian Government for the oceanographic investigation of the Adriatic by Austrian and Italian specialists. Four sections were sounded from east to west, while others were at the same time being executed by the Italian surveying ship *Ciclope*. Temperature, density, and salinity of the water were also studied, though the "Bora" blowing down the gulf hindered the work at times.

IN *Erganzungsheft* No. 4 of the *Mitteilungen aus den Deutschen Schutzgebieten* Dr. F. Jaeger gives the result of a very thorough exploration carried out in 1906 and 1907 in the southern portion of the Eastern Rift Valley, to the south-west of Kilimanjaro, and to the south-east of Lake Victoria. As careful a survey was made of the

region as time would allow, and accurate triangulation was utilised to control the topographical work. A large collection of geological specimens was made, and these are described in the present memoir, but no general account of the structure of the district is given. The form of the ground traversed is indicated by form-lines on two maps of large scale (1:150,000), but is not described in the text. A vast crater basin with many minor vents occupies the northern portion near Lake Njarasa (Eyassi), and many points rise to more than 3000 metres. The whole area is immature in its topography, the drainage lines being short and steep, leading to the floors of the fault valleys in which the lakes are situated. The southern portion shows more clearly a series of parallel fault-blocks striking N.E., with lakes or marshes occupying the low-lying ground between. The meteorological observations have not been printed, but have been autographed and deposited at various institutions in Germany. As a study of earth forms, the maps are highly instructive.

THE report of the Botanical Club of Canada for 1909, issued by the secretary, Dr. A. H. Mackay, contains the announcement that the club has been dissolved, and that the work of collecting and tabulating phenological observations in the Dominion, formerly undertaken by the club, has been transferred to the officials of the Meteorological Service.

A SHORT paper contributed by Dr. Wm. Trelease to the Transactions of the Academy of Science of St. Louis (vol. xviii., No. 3) deals with the species of *Agave* cultivated during recent years in Mexico under the name of "zapupe." Of the various forms for which numerous local popular names exist, five different species, all new to science, are delimited according to spine characters, and these fall into three groups. They may be distinguished as "azul," "Tepezintla," "ixtle," "cimarrón," and green zapupe, and are probably all referable to the section *Euagave*; as cultivated plants they rarely set capsules, and appear to be freely bulbiferous after flowering.

IN the absence of definite criteria, the phylogeny of the algae provides scope for varying opinions and hypotheses. Thus in the *Biologisches Centralblatt* (April 15) Mr. J. Brunthaler elaborates the view that the red algae are the most primitive. A primary reason is supplied by the argument that in early times the earth was surrounded by a dense vapour through which the sun penetrated with difficulty, and therefore the conditions of diffused light which prevailed were similar to those under which most red algae now live. The origin of the group is referred to primitive ancestors of the Flagellatæ. Next in sequence are placed the brown algae, derived partly from red forms and partly from the Flagellatæ, while the youngest line of development is assigned to the green algae.

THE cold days of May were rather late in their occurrence this year, but were experienced towards the close of the period shown by the average results for a series of years. This year, May 19, 20, and 21 were the only really cold days, the maximum temperature for the period at Greenwich being 56.5°, and on May 20 the highest temperature was 52.3°. Last year the cold days in May fell fully ten days earlier, and in 1909 a week earlier. A brisk northerly wind was blowing this year, and an anticyclone was situated in the Atlantic in close proximity to our coasts. A change to warmer weather set in on May 22, when at Greenwich the shade temperature ranged from 35° in the early morning to 70° at midday. The summary of the weather for the week ending May 20, issued by the Meteorological Office, shows that the mean temperature

for the week was above the average over the whole area of the British Islands, the greatest excess being 3.6° in the Midland counties, and the least 1.1° in the north of Scotland. The absolute temperature ranged from 73° in the east of England to 33° in the east of Scotland.

A NEW edition (the seventh) of the handy "Hints to Meteorological Observers," prepared under the direction of the Council of the Royal Meteorological Society by Mr. W. Marriott, has been received. The present edition has been revised and enlarged; the explanations and illustrations of ordinary and self-recording instruments are very satisfactory. We are glad to find a considerable addition to the very useful glossary of meteorological terms, including those most recently introduced. We think this might be still further improved by more additions, and occasionally by a little fuller explanation. We notice here and there a slight departure from the explanations usually given, e.g. the order of the colours of the corona. We can only repeat the opinion before expressed, that the work takes a high place among the best of such handbooks published in any country.

AN interesting article on the weather in the seventeenth century, by Mr. W. Sedgwick, is published in *Symon's Meteorological Magazine* for May, containing extracts relating to the spring (March-May) between 1658 and 1705 from the diaries of John Evelyn, F.R.S., and Samuel Pepys, F.R.S. The author proposes in this and subsequent numbers to give an opportunity of considering whether these extracts show that any marked change in the climate of London has occurred since that period. Statements are often made that our climate has undergone considerable changes in comparatively modern times. On the other hand, well-known investigators of the present day have shown that any apparent changes either in temperature or rainfall can be accounted for by the difference in the instruments and their exposure. Although these instruments were known before the close of the seventeenth century, there were but few in existence; they cannot have been used regularly, if at all, by Evelyn or Pepys, and the tendency in the case of non-instrumental observations would be to record abnormal rather than normal conditions. Another important consideration pointed out by the author is the change from the Julian to the Gregorian Calendar, which was made in England in 1752. With reference to the popular belief about the old-fashioned Christmas, in several years during the last decade there have been considerable falls of snow after Christmas which would have occurred before Christmas if the Julian Calendar had been still in force.

THE Journal of the Royal Statistical Society for May contains an important paper, by Mr. E. C. Snow, on a new method of estimating post-censal populations, i.e. the populations of different districts of a country in the years following a census. The estimation of such populations often offers considerable difficulties, especially in districts of a rapidly changing character in the neighbourhood of large towns, and the method at present in official use—based on the assumption of the approximate maintenance of the rate of change during the preceding intercensal decade—may lead to very serious errors. For example, the birth- and death-rates in Salford in 1890, based on the estimated population, were calculated at 28.8 and 22.4 respectively, but when the results of the census taken in the following year were made known, these figures were altered to 35.6 and 27.6. Mr. Snow suggests that definite indices of a change of population, such as changes in the number of births, deaths, marriages, or houses, should be

used as the basis of the estimate, that regression equations should be formed by the method of correlation between the change in population of a district and the changes in these several indices during a completed intercensal decade, and that these regression equations should be applied to the following decade. Trial of the method on several groups of districts of diverse characters showed that it would lead to greatly increased accuracy.

INVESTIGATIONS of the hitherto almost unknown ultra-violet spectrum—the Schumann region—are of special interest, because the conditions attending the production of these extremely short wave-length radiations are obviously of a different character from those attending the production of the more familiar spectrum. In this research Mr. Theodore Lyman has taken a great part, and in the March number of *The Astrophysical Journal* (vol. xxxiii., No. 2, p. 98) he publishes results obtained from an investigation of the nature of the radiation from oxygen, hydrogen, nitrogen, helium, and argon in the region more refrangible than λ 1900. No lines of helium and oxygen have yet been discovered in this region; if they exist they are too faint to be disclosed by the present methods. By varying the conditions of discharge in the vacuum tube, two spectra of nitrogen were revealed, one of faint bands with heads on the more refrangible edges, the other consisting of two pairs of sharp lines at $\lambda\lambda$ 1492.8, 1494.8, 1742.7, and 1745.3. No lines were seen in the "red spectrum" of argon, but a considerable number, about forty between λ 1333.7 and λ 1886.1, exist in the "blue spectrum." Repeating the experiments made by Schumann, Mr. Lyman has, as yet, been unable to obtain the primary spectrum of hydrogen which Schumann suspected. An interesting spectrum, apparently intimately associated with hydrogen, appears in the region λ 1650– λ 1450, and consists of five groups, each group containing five lines. Argon containing a trace of hydrogen at a pressure of 2 or 3 mm. shows this spectrum well if aluminium electrodes and no capacity are employed. Nitrogen, oxygen, and helium containing a trace of hydrogen do not show the groups, and if other electrodes are used considerable enfeeblement occurs. With pure hydrogen these groups always appear—with the other lines—and they disappear if the last trace of hydrogen is removed from the argon mixture. If their origin is an impurity in the hydrogen, it must be of a fundamental character, for the groups appear in all the hydrogen used by Lyman and by Schumann for many years; they may be a new spectrum of hydrogen. For a description of the apparatus and methods employed in the research the reader is referred to the original paper.

THE April number of *Le Radium* contains a memoir by M. L. Dunoyer, of the laboratory of Madame Curie, on the production of a material radiation of purely thermal origin. A tube of hard glass about a centimetre in diameter and about 30 centimetres long is joined at its upper end to a wider tube, the length of which varies from 2 to 13 centimetres in different cases. A side tube leads from the enlarged head to a Gaede pump. The lower end of the tube is covered inside with a film of metallic sodium obtained by distillation *in vacuo* from a heated tube originally communicating with the experimental tube, but sealed off when the deposit has been formed. When the lower part of the tube is now heated, so as to vaporise the sodium and drive it into the upper part of the tube, it is found that if diaphragms with small openings of the order 2 or 3 millimetres diameter are placed in the tube above the sodium deposit, the molecules of vapour are driven through the openings with such velocity that they form a

deposit on the end of the enlarged part of the tube which reproduces the shape of the opening of the last diaphragm through which the vapour has passed. If a plate with holes of any form in it is interposed in the path of the molecules, the deposit on the end of the tube reproduces the openings sharply. M. Dunoyer is already engaged in experiments to determine the kinetic energy of the projected molecules or particles and to measure their electric charge, if any.

Red Book No. 155 of the British Fire Prevention Committee deals with the loss of life at the Asch Building fire in New York on March 25. It will be remembered that there were 145 deaths. The committee has procured a trustworthy report from Prof. Ira Woolson, of New York; this report was originally prepared by Mr. F. J. T. Stewart, superintendent of the New York Board of Underwriters. This great loss of life occurred where the structural damage was relatively small, and practically affected only the fittings and equipment of the three top stories of the building. Bad planning and exit facilities, neglect of the ordinary precautions to prevent an outbreak of fire, the absence of any prearranged system of utilising the existing appliances, together with neglect to have all routes of exits clear for easy and immediate use, are the primary causes of the catastrophe. The building comprised a sub-basement, basement, ground floor, and nine floor levels; its height may have some bearing on the total number of lives lost, but scarcely on the general extent and character of the calamity.

We have received a pamphlet from Mr. Wm. Love, of 42 Claremont Square, London, N., giving particulars of his system of maintaining straight the rolls used for rolling flat sheets. The method appears to be novel, and consists in supporting the rolls by means of intermediate bearings. These bearings are in turn supported by means of beams, so arranged that the deflections of all the bearings under a uniform load on the roller are equal; hence the roller remains practically straight. There are no supports at the ends of the roller. Suppose, for example, that four intermediate bearings are fitted. The roller is divided into four imaginary equal segments, and each bearing is at the centre of a segment. The four bearings are supported on a beam, which we may imagine to be divided into two equal segments. This beam is supported at two points, one at the middle of each segment, and the supports are formed symmetrically on a longer beam, which is in turn supported at its ends. On the latter beam deflecting under the load, the two points at which the first beam is supported will suffer equal deflections, and by the arrangement of bearings on the first beam, all these bearings will deflect equally. In this system the roller may be much less in diameter than has been customary, as reliance on its stiffness is unnecessary. For example, a roller 2 inches diameter by 24 inches long, supported in the ordinary way, would deflect, say, 0.1 inch; supported on Love's system, the deflection for the same load is $1/2560$ inch. Other applications of the principle are given in the pamphlet.

MESSRS. MACMILLAN AND CO., LTD., announce for early publication the third English edition of Prof. W. Nernst's "Theoretical Chemistry," corresponding to the sixth German edition, and translated by Mr. H. T. Tizard, Magdalen College, Oxford. The portion of the book dealing with thermodynamics has been largely rewritten and includes a detailed account of the author's new theorem of thermodynamics. A chapter on radio-activity has also been added. The text of the earlier English edition has been completely revised and partly rewritten. The trans-

lator has also made some additions to the text, at the suggestion of Prof. Nernst, in order to bring the book up to as late a date as possible. These include an account of Nernst's work on specific heats at low temperature, and a short summary of Perrin's recent researches on Brownian movements.

MESSRS. E. AND F. N. SPON, LTD., announce for early publication "Bibliographical History of Electricity and Magnetism Chronologically Arranged," by P. F. Mottelay.

OUR ASTRONOMICAL COLUMN.

METCALF'S COMET, 1910b.—An observation of Metcalf's comet was made by Dr. Schiller at the Bothkamp Observatory on April 18, and showed that the comet still has a sharply defined stellar nucleus of magnitude 13.5. The total brightness was about equivalent to that of a star of magnitude 12.8, and when thin clouds obscured the comet the nucleus could still be seen. Dr. Ebell continues his ephemeris up to the end of July, when the estimated magnitude will be 14.8. The present position of the comet is two or three degrees north of κ and i Ursæ Majoris (*Astronomische Nachrichten*, No. 4495).

RECENT OBSERVATIONS OF HALLEY'S COMET.—Prof. Barnard secured good observations of Halley's comet on April 16, 23, and 25, but finds that the object is rapidly growing fainter. On April 23, in a very good sky, the magnitude was estimated to be 14.5 or 15.0, but on April 25, with the sky not quite so good, it was estimated to be 15 or 16. Prof. Barnard states that the brightness has been subject to considerable fluctuations, and at the time of the second observation was probably in one of its fainter phases (*Astronomische Nachrichten*, No. 4500).

EARLY VISIBILITY OF THE NEW MOON.—Mr. Horner's observation of the new moon is discussed by Mr. Whitmell in No. 435 of *The Observatory* (May, p. 203). It appears that the observation was made when the moon was but sixteen, not seventeen, hours' old, which, so far as is known, constitutes a record; the moon was "new" at 1h. 13m. on the morning of February 10, 1910, and was seen by Mr. Horner, whilst looking for comet 1910a, at 5h. 13m. the same evening. The difference in azimuth between the sun and moon was roughly 10° , and, according to a paper which Mr. Fotheringham published in the *Monthly Notices* (R.A.S.) for May, 1910, the moon should be unobservable if its altitude were lower than 11° ; but when Mr. Horner saw it the moon had an altitude of only 4° or 5° .

LARGE PROPER MOTION OF A SMALL STAR.—The examination of plates taken in 1892 and 1906 led Prof. Max Wolf to the conclusion that a 9.7 mag. star in Leo had an extraordinary proper motion. This was confirmed by Prof. Burnham, who has since kept the star under observation, and, from measures made during the period 1907–11, together with the 1892 photograph, finds that the most probable value for the proper motion is $1.228''$ in 190.4°. The star's position (1900) is R.A. = 11h. 23m. 20s., dec. = $+8^\circ 6' 1''$, and it is 70s. preceding, and $185''$ north of, the 7.5 magnitude star B.D. + $8^\circ 25' 12''$ (*Monthly Notices* (R.A.S.), vol. lxxi., No. 6, April).

PHOTOGRAPHIC DETERMINATIONS OF STELLAR PARALLAX.—Having described the methods of photographically determining stellar parallaxes with the Yerkes 40-inch refractor, Dr. Schlesinger is now discussing the results in his series of papers appearing in *The Astrophysical Journal*. In papers iii. and iv. of the series (*The Astrophysical Journal*, vol. xxxiii., Nos. 2 and 3) he gives the results for fourteen stars, and in four cases finds positive parallaxes exceeding $0.1''$. These are Groombridge 34, $\pi = +0.266'' \pm 0.010''$; μ Cassiopeæ, $\pi = 0.105'' \pm 0.010''$; Weisse I., 5h. 592, $\pi = +0.189'' \pm 0.010''$; and Fedorenko 1457–8, $\pi = +0.148'' \pm 0.015''$. The last-named is a well-known double star (≈ 1321), which has a proper motion of $1.7''$ per annum, and Dr. Schlesinger gives an interesting discussion concerning the probable source of a systematic error which appears, including therein a discussion of the effect of atmospheric dispersion on the measured images of the stars.